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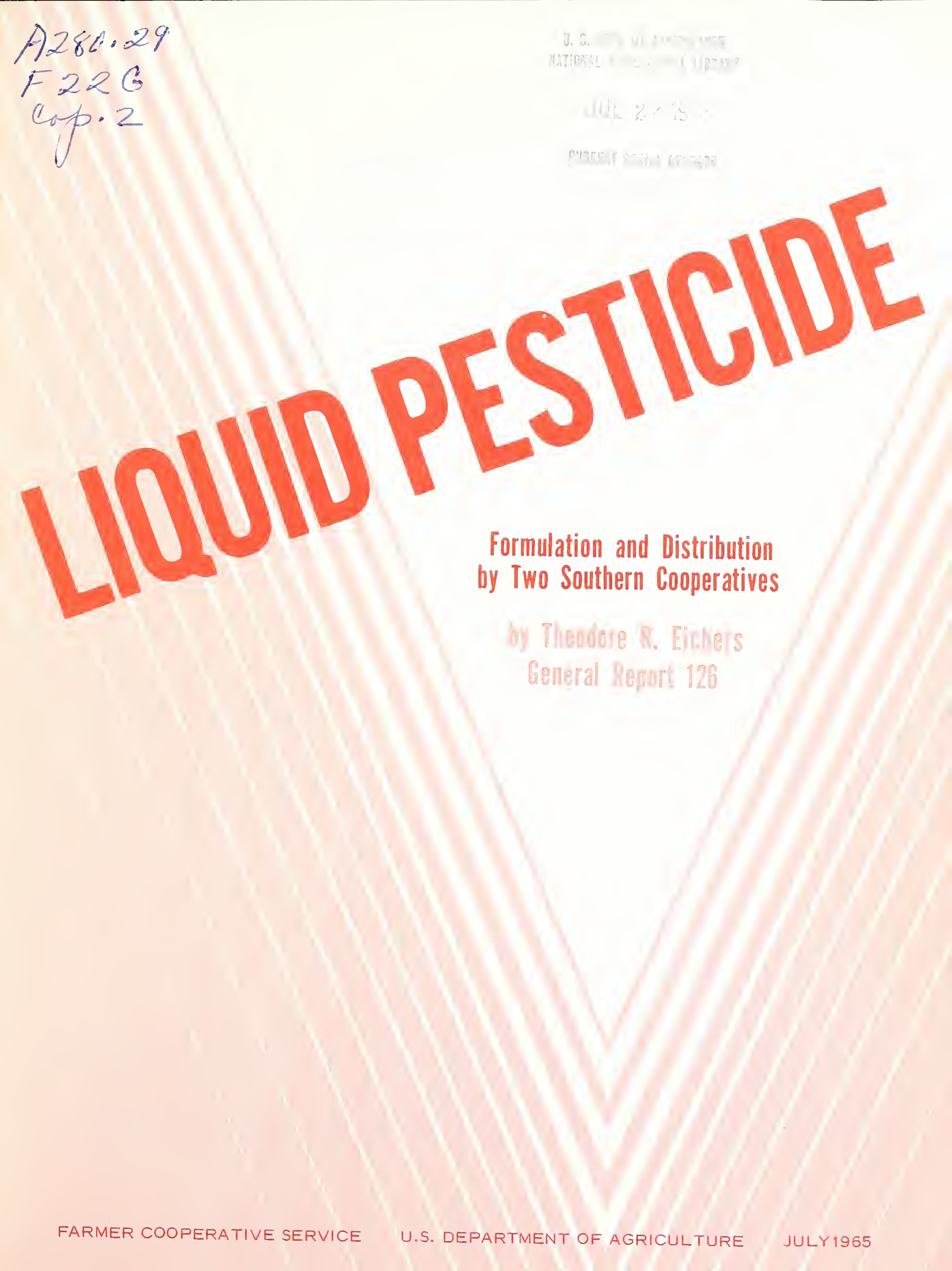

LIQUID PESTICIDE

Formulation and Distribution by Two Southern Cooperatives

by Theodore R. Eichers

General Report 126

FARMER COOPERATIVE SERVICE U.S. DEPARTMENT OF AGRICULTURE JULY 1965

FARMER COOPERATIVE SERVICE
U.S. DEPARTMENT OF AGRICULTURE
WASHINGTON, D.C. 20250

Joseph G. Knapp, Administrator

The Farmer Cooperative Service conducts research studies and service activities of assistance to farmers in connection with cooperatives engaged in marketing farm products, purchasing farm supplies, and supplying business services. The work of the Service relates to problems of management, organization, policies, financing, merchandising, product quality, costs, efficiency, and membership.

The Service publishes the results of such studies; confers and advises with officials of farmer cooperatives; and works with educational agencies, cooperatives, and others in the dissemination of information relating to cooperative principles and practices.

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Liquid Pesticide Formulation and Distribution by two Southern Cooperatives

by Theodore R. Eichers
Farm Supplies Branch
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Chemicals for the control of agricultural pests are essential for efficient crop and livestock production. In 1964, farmers in the United States purchased over $450 million worth of such chemicals. This was an increase of 150 percent over the amount spent 10 years earlier.

About 90 percent of the chemicals farmers buy are used on crop pests. A survey in 1958, indicated 96 million acres of farmland were treated with chemicals. A large proportion of these chemicals were dry materials or dusts.

Farmers are purchasing increasing amounts of farm chemicals through their cooperatives. In 1962-63, 3,089 cooperatives distributed $64.7 million worth of pesticides, compared with $22.1 million worth by 1,111 cooperatives in 1951-52. Farmers purchased about 19 percent of their pesticides through their associations in 1962-63, compared with 11 percent 11 years earlier. The States which lead in the amounts of pesticides handled by cooperatives were: Mississippi, Florida, Washington, California, and Pennsylvania.

Local retail cooperatives obtained about $31.7 million worth of pesticides (at wholesale) from regional wholesale associations to which they belonged in 1962-63. This volume probably represented between two-thirds and three-fourths of their purchases that year. These regional associations own about 25 plants formulating dry pesticides and 5 formulating liquid pesticides.

In recent years, there has been a rapid expansion in the demand for liquid chemicals. Between 1955 and 1960, a group of Southern cooperatives indicated their sales of liquid insecticides (emulsifiable concentrates) had increased from 36 to 63 percent of their crop-insecticide volume. The proportion of liquids probably is considerably greater today. Farmers prefer liquid chemicals because they are generally more convenient and pleasant to handle than dusts or wettable powders. In addition, they frequently can be applied with the same equipment used for liquid fertilizer.

Cooperatives are interested in developing and improving the distribution of pesticides. Also they are interested in the possibilities of liquid-pesticide formulation as a means of realizing savings, eliminating extra handling of materials, and providing farmers with the type and quality of chemicals they need.

Note: The author wishes to express his appreciation to the officers and employees of Valley Chemical Company, Greenville, Miss., and Valley Co-op Oil Mill, Harlingen, Tex., for their excellent cooperation and helpful assistance in providing information for this report.

Scope and Purpose of the Study

Because liquid pesticides are a recent development, information on their formulation and distribution is limited. Farmers need to know that through cooperative ownership they can help assure themselves of quality pesticides and related services at reasonable prices.

The purpose of this study is to provide information that will be useful to cooperative management in establishing or improving their handling of liquid pesticides. Specifically, the study indicates the services, facilities, formulation and distribution methods, quality control and safety practices, possible problems, and farmer benefits of this type of operation and service.

This report examines 2 cooperative liquid-pesticide formulating and distribution operations. They are located in cotton producing areas of the South. Valley Chemical Company is located at Greenville, Miss., in the heart of the Mississippi Delta, and Valley Co-op Oil Mill is located at Harlingen, Tex., in the Rio Grande Valley near the Gulf. Their services and programs met with almost immediate success in filling farmers' needs for quality liquid-pesticide products.

The experience of these cooperatives should be helpful to other cooperatives who are considering expanding their pesticide services by formulating liquid farm chemicals.

Valley Chemical Company

Valley Chemical Company, Greenville, Miss., was organized as a farmer cooperative in 1955 to formulate liquid pesticides. It now provides chemicals used in cotton production for about 650 cotton farmers in the Mississippi Delta. These farmers raise about 200,000 acres of cotton, or about 35 percent of the total grown in the area served by the association.

Chemicals used in cotton production in the Mississippi Delta are a sizeable farm expense item--about $20 an acre annually.

Farmers in the Delta used to have chronic difficulty in locating a dependable source of quality pesticides. Thus, when a firm in Greenville, Miss., announced in 1955 that it would dispose of its liquid- and dust-pesticide formulating facilities, a group of Delta cotton farmers decided to purchase them and produce their own chemicals for use in cotton production.

A semiretired cotton farmer who had been growing cotton in the Delta for 30 years was primarily responsible for interesting farmers in organizing the chemical cooperative, since obtaining quality chemicals had always been a problem for him. He visited many farmers personally and organized a series of meetings to discuss the merits of this undertaking. The charter members of Valley Chemical Company were 125 farmers. They invested $125,000, to purchase the Greenville plant and facilities valued at $75,000, with an inventory valued at $50,000.

Each member invested $2 in the cooperative for each acre of cotton he raised. The 125 initial members raised a total of 62,500 acres of cotton, or an average of 500 acres per member.

The purposes of Valley Chemical are as follows: (1) To manufacture and distribute quality materials, (2) To save stockholders money; service at cost with one price to all, (3) Economical operation, (4) Courteous and efficient service, and (5) To keep stockholders posted on insect conditions and new products.

The membership of Valley Chemical has increased over fivefold since its organization--from 125 in 1955 to 650 in 1964. Members include from 60 to 70 percent of the largest cotton farmers in the area, who use chemicals extensively. In terms of stock investment and acreage subscribed, the association has increased 2 1/2 times since its start. Farmers now have $310,000 worth of stock in the association.

The affairs of the association are conducted by a board of 18 directors which meets 4 times a year. Directors are elected for a 1-year term and a large proportion are reelected each year. The present board is essentially the same as when Valley Chemical was first organized.

Distribution System

Valley Chemical Company now serves a 75- by 150-mile section of the Delta. Sales and deliveries of supplies are made direct to farmer patrons.

Initially farmers picked up chemicals at the Greenville plant; however, as the association grew and the territory expanded, it authorized or established depots or warehouse points at various locations in the territory. At present, there are 13 such depots operated by farm supply and other dealers in the area. They are paid a specified fee per gallon for handling the chemicals.

Requests to establish a new depot must come from farmers in a locality. Before a new depot is authorized, $8,000 worth of stock representing 4,000 new acres of cotton must be subscribed. In addition, the new depot must have a good potential for doubling this acreage by the second year.

Materials Formulated

Valley Chemical formulates about 70 percent of the total volume of chemicals it distributes. It produces almost all of its members' insecticide and defoliant requirements. The proprietary chemicals handled are mostly herbicides.

In the past about 90 percent of all chemicals handled by the association were used on cotton. The remaining 10 percent were used on rice and soybeans. However, the association is expanding its services to rice and soybean growers.

About 90 percent of the output of the formulating plant is insecticides and 10 percent, defoliants. The plant has both liquid-formulating and dust-blending equipment; however, about 90 percent of the total plant output is liquid--emulsifiable concentrates of DDT, methyl parathion, toxaphene, endrin, and combinations of these. About 36 items are formulated with about 7 items accounting for over half of the volume. In addition about 90 resale items or jobbed products are handled. Ten items account for over half of this volume. Thus, Valley Chemical is able to provide its members with a complete line of farm chemicals.

Facilities

The association has 4 buildings used for formulating and warehousing chemicals. The combined warehouse space amounts to 17,000 square feet. In addition, 2,000 square feet is devoted to the formulating area. These buildings were valued at $75,000 at the time of purchase in 1955.

The liquid-formulating area is not enclosed except for a roof and a concrete floor. This enables adequate ventilation both for comfort and for dissipating poisonous vapors.

Equipment includes 2 500-gallon kettles with steam coils for the manufacture of insecticides and defoliants. Production capacity is 1,000 to 1,500 gallons of emulsifiable concentrates per hour, or 8,000 to 12,000 gallons in an 8-hour day. In addition, there are 2 ribbon-type dust blenders, each with a capacity of 4,000 pounds per hour and a Mikro Mill for blending dry materials.

Valley Chemical Company's liquid pesticide formulating plant located in the Mississippi Delta.

Financial Operations

Valley Chemical Company had pesticide sales of about $3.6 million in 1963, and $3.5 million in 1964.

Assets of the association on November 30, 1964, totaled $927,472. Of these, $72,706 were facilities and equipment; $26,601 was land; and $828,164 were current and other assets. Member equities or net worth totaled $391,483.

The association was able to supply proprietary chemicals to members on the basis of cost of materials laid in at Greenville, Miss., plus 7.3 percent for all handling costs in 1963, and 8.5 percent for 1964. For products formulated, expenses in 1964 consisted of about 2 percent for manufacturing and 2.5 percent for sales and delivery and 3.5 percent for administration (as a percentage of cost of sales).

Valley Chemical prices its chemicals at competitive or slightly higher-than-competitive prices. However, prices or costs to member patrons are adjusted at the end of each year by means of patronage refunds declared from net margins. Last year the refund amounted to over 18 percent of sales. All net margins are paid out as patronage refunds, since no dividends are paid on capital stock.

Members are not obligated to purchase their pesticides from Valley Chemical, but most of them do so. This may be partly attributed to the savings realized and the fact that members have a substantial investment in the association based on the acreage of cotton grown.

Employees

The manager of Valley Chemical Company is a trained chemist. Before coming with Valley Chemical, he was employed by a chemical company where he worked in production, product development, and production management.

In addition to the manager, the association employs about 10 people full time, including a fieldman, who is director of education, 2 fieldman assistants, and the needed secretarial and warehouse personnel.

During the busy season, May to September, the association adds about 12 people to its payroll making a total of 23. There has generally been no problem obtaining seasonal help because of the possibility of overtime work. In 1955 and 1956 when dusts were still in large demand, the plant operated on a

3-shift basis; however, since the demand has changed to liquids, it has operated only 1 shift (about 9 1/2 hours) a day even during the peak season.

Obtaining and Handling Materials

Maintaining the proper amount of inventory is one of the major problems in formulating and distributing pesticides. This problem results from the large number of items formulated and the large amount of proprietary items handled.

Valley Chemical obtains most of its technical materials from 5 major basic suppliers. The association has had little difficulty obtaining technical materials except for strobane; but since that is essentially the same as toxaphene, no serious effort has been made to obtain it. Valley Chemical has a prompt payment policy in dealing with technical suppliers.

The association has found proprietary chemicals are a little more difficult to obtain--especially when new items are in limited supply.

Liquids are packaged in 55-, 30-, and 5-gallon drums and dust products in 50-pound bags. Little hand labor is used in handling ingredients or finished materials. Nearly all materials are transferred by pipelines or with forklift machines.

Valley Chemical normally stocks an inventory adequate to meet farmers' current needs. At the beginning of the season, inventories of different items vary from 10 to 100 percent of the season's needs, depending on projected supply situations, anticipated needs, and actual demand.

Most of the chemical suppliers will take back a certain part of the stock remaining at the end of the season, depending on the amount used during the season. Valley Chemical carried over into 1964 $230,000 worth of chemicals, or about 6.5 percent of its 1963 volume.

The association has ample warehouse space--17,000 square feet at the Greenville plant, including 2,400 square feet of heated storage. A complete inventory also is maintained at each of the 13 local depots or warehouses with which the association has storage arrangements. Chemicals are delivered to the depots by Valley Chemical's trucks, and farmers pick up most of their requirements from the depots. Valley Chemical does not do custom application of pesticides, but local depots will arrange for custom service with local applicators.

Safety and Quality Control

Valley Chemical has a safety program to protect the health of its employees. The association has had an excellent safety record. No employee in the association's history has suffered even minor injury from exposure to toxic insecticides.

Employees when they begin work are briefed on the poisonous nature of the chemicals they will be working with and on the need for caution in handling these materials. All plant workers are required to wear protective clothing and masks.

Employees working with the chemicals are examined periodically by a physician to determine buildup of parathion in the body and other possible harmful chemical effects. If any are observed, immediate remedial action is taken.

Management reports that formulating the liquid materials in a shed with only a roof over it contributes much to the employees' safety because volatile fumes dissipate rapidly.

Farmers are also informed of the characteristics of the chemicals they use and the precautions they should take to protect themselves, their crops, their livestock, and the natural resources.

The association has its own quality control program, wherein all products must meet certain specifications. In addition, products formulated are registered with the U.S. Department of Agriculture, and carry labels indicating their active material content and the precautions necessary for their safe use.

Valley Chemical tests the effectiveness of new products in small, 5-acre farm plots before they are produced or marketed on a large scale. Chemical companies also are invited to farm meetings to discuss their new products and the research on their effectiveness to control specific pests. Thus the association evaluates the chemicals it produces and markets, and assures its members of the most effective current chemical pest control procedures.

Promotional and Educational Activities

Valley Chemical officials believe that farmer education is essential to the success of its farm chemical program. The association's educational program is under the direction of a full-time fieldman who works closely with county agents and the State extension entomologist. The program includes the following features:

1. A series of local area farmer meetings at the various depots. At these meetings new and recommended chemicals are evaluated, advisable application rates for various soil types under local weather conditions are suggested, and prices of new chemicals are analyzed in terms of cost per acre and the savings to result from their use.

The field director has found that these meetings are attended better in rainy weather when the ground is too wet for fieldwork. Therefore, local meetings are scheduled immediately following a rain. Sometimes a meeting is decided on only one day ahead and still gets a good crowd. These meetings draw from 15 to 75 farmers.

2. An annual Farm Chemicals Use Clinic. This is an all-day meeting at which representatives of basic chemical manufacturers present information about their products and discuss promising new chemicals. From 550 to 625 farmers attend this meeting each year.

3. Periodic letters on chemical pest control. At various times letters are sent to members pointing out the need for insecticides and herbicides. During the season, a weekly situation letter advises on current insect conditions and forecasts for the following week.

4. Assistance to farmers in sprayer calibration and other application problems. This is provided especially when a new chemical is introduced to assure the farmer the best results.

5. Field scale demonstrations of new chemicals. The new chemicals are applied at varying rates to determine the most effective treatment. Results of these tests are explained at the various farmer meetings.

The management of Valley Chemical sums up their educational program this way, "In view of the constantly increasing cost of labor, the farmers' only choice is to learn to use chemicals properly and then use them. It is our purpose to support both the farmer and the industry through this type of educational selling."

Valley Co-op Oil Mill

Valley Co-op Oil Mill, Harlingen, Tex., lies in the heart of the fertile Rio Grande Valley where cotton production is the major agricultural enterprise. Twenty cotton gin cooperatives serving 2,000 farm members in the valley organized Valley Co-op Oil Mill in 1946 as a bargaining agency to market their cottonseed.

This was Valley Co-op's sole activity until 1951 when it constructed an oil mill. The association currently processes about $3.25 million worth of cottonseed annually.

In 1962 Valley Co-op decided to add a chemical division to formulate its own pesticides. Farm chemicals had become an absolute necessity in producing quality cotton, and represented a substantial operating expense. Also, farmers in the Rio Grande Valley had been experiencing difficulty in obtaining quality pesticides for some time. The association reported that a substantial proportion--estimated at 20 percent--of the pesticides tested by State control officials in 1962 did not meet legal requirements.

The chemical division is an operating department of the Valley Co-op Oil Mill. However, it is separately financed with funds borrowed from the cottonseed oil mill division, and maintains separate records and has its own annual audit.

Valley Co-op's board of directors is composed of 20 members who serve a 1-year term. The board meets monthly to review the operations of both the oil mill and the chemical division.

Distribution System

Initially, Valley Co-op distributed chemicals only to its 20 member gins and their 2,000 farm members. However, in 1963 the cooperative extended its services to cooperatives throughout Texas. The association now serves about 100 local cooperatives in the State.

Only the initial 20 member gins are members of the association. Members are not obliged to purchase from Valley Co-op. Therefore, products are priced strictly in line with the going market for similar items. And while gin members market all of their cotton through the 20 gins, they presently purchase only about half of their chemical requirements from them.

Patronage refunds on chemicals are distributed at the same rate to member and nonmember cooperatives.

Materials Formulated

Valley Co-op formulates primarily chemical materials used in cotton production, under the association's own brand name. In 1964, over 90 percent of the chemicals handled were cotton insecticides. Some products are used on other crops--mostly vegetables--grown in the area.

This cooperative formulates a complete line of liquid cotton chemicals under its own brand.

The association formulates only liquid pesticides (emulsion concentrates) in its plant, which account for 95 percent of all chemicals it distributes. Valley Co-op also has a few dusts formulated to its specifications under its brand by a local dust formulator. The association formulates about 20 items of which about 5 account for over half the total volume. In addition, the association handles a small amount of proprietary chemicals, produced by the major chemical companies.

Financial Operations

The chemical division maintains separate accounts and has a separate audit prepared on its operations.

Assets of the division on September 30, 1964, amounted to $412,000, of which $139,000 was in buildings and equipment (depreciated value); $174,000 was in inventories; $73,000, in accounts receivable; and $26,000, in other assets. Member equities or net worth totaled $110,000.

Sales of the division in 1963 were $1,170,000--nearly double the 1962 volume. Of this sales volume, $1,120,000 was Valco liquids formulated by the association; $25,000 was Valco dusts formulated by another formulator; and $25,000 was other chemical products handled by the association. Sales in 1964 were $1,496,000 with about the same proportion of these 3 types of products.

The association was able to supply pesticides at cost of materials at Harlingen, Tex., plus 15 percent for handling in 1963, and 14 percent in 1964. Handling expenses in 1964 consisted of manufacturing costs of about 3.8 percent; sales and delivery expense of about 4.7 percent; and administrative expense of about 5.5 percent of the cost of patrons' purchases.

Technical chemicals accounted for 85 percent of the cost of materials; emulsifiers, 4 percent; solvents, 4 percent; and containers, 7 percent.

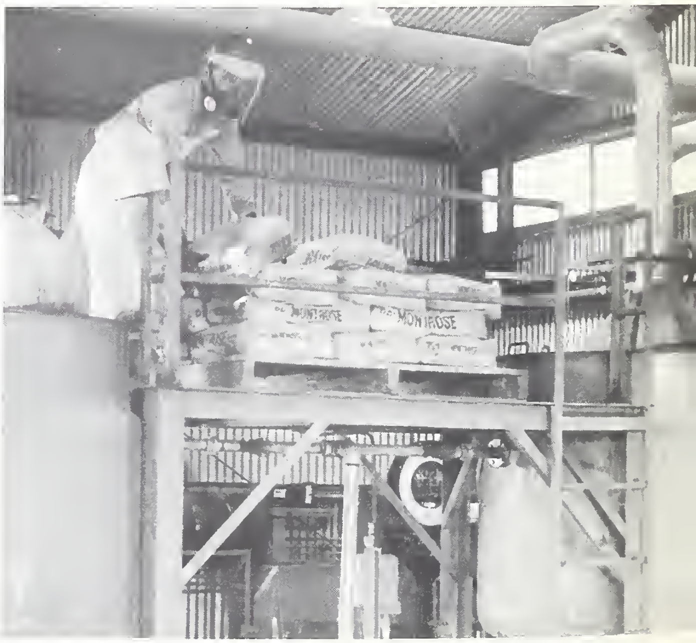
Patronage refunds amounted to nearly 6 percent of sales in 1963 and to 4 percent in 1964. Of these, 20 percent was paid in cash, and 80 percent was retained as member equity capital to better finance operations.

Employees

The seasonal nature of the pesticide formulating operation creates some problems in obtaining and training employees. Over 90 percent of the year's output is formulated between April and August, and from two-thirds to three-fourths is produced in June and July.

The chemical division usually has 9 or 10 full-time employees. These include the manager, sales manager, chemical production manager, plant foreman, secretary, laboratory technician, 2 or 3 maintenance men, and 2 fieldmen.

The plant starts adding seasonal help in March and employs a total of about 35 people in June and July.



The cooperative is concerned about the welfare of its employees and has an excellent safety program for their protection.

During much of the season, employees work 10 or 12 hours a day. During a large part of June and July, the plant operates 2 shifts. Usually, during the second shift, much time is spent in warehousing, packaging, and in cleaning and preparing for the next shift. When 2 shifts are operated, the main production is at night to enable daytime workers to load trucks and move material out.

The association has had little problem in obtaining or training seasonal help. In fact, it has been able to obtain the help needed because workers like the large amount of overtime work. Management believes it costs less to operate its regular shift overtime than to add a new shift with inexperienced help.

Facilities and Equipment

The formulating equipment consists essentially of 2 600-gallon mixing kettles, 1 900-gallon kettle, and the pipelines and other equipment to charge the kettles and drum off the finished product. The capacity of these 3 units in a 10- to 12-hour shift is about 12,000 gallons.

The plant has a formulating and warehousing area of 60 by 180 feet and another warehouse 80 by 120 feet. The main warehouse was originally used by the cottonseed mill. The buildings are wood frame with metal siding and are located on a rail siding.

The formulating and warehouse area is entirely on one level. Thus, front-end loaders can be conveniently operated. In addition, delivery trucks can be driven through the center of the building. Almost all material handling is by means of pipelines or front-end loaders.

Initial cost of buildings and equipment amounted to $162,000. Of this, $95,100 was for buildings and land improvement, $63,600 was for equipment, and $3,300, for bulk storage tanks. Present depreciated value of buildings and equipment is $139,000 (September 30, 1964).

One kettle and some laboratory equipment have been added since the plant began operating 2 years ago. Facilities and equipment are considered adequate for present needs.

Obtaining and Handling Materials

Technical materials are obtained from the major chemical companies. Valley Co-op likes to have several suppliers for each item, thus assuring itself of a source in case one supplier is out of stock. Technical ingredient suppliers generally will credit back a portion of the formulator's ingredients still on hand at the end of the season. The amount is usually based on a percentage of the volume purchased during the season.

Most ingredients are obtained from local supply depots of the chemical companies and can be obtained in a short time. Thus, the association does not need a large inventory of ingredient materials or finished products. It picks up much of the ingredient materials in its own trucks, especially in the off-season. Much of the liquid technicals and solvents is obtained in bulk trucks and tank cars. DDT, the largest technical item, is a bead and is obtained in bags.

There is very little hand labor involved in handling ingredients or finished materials. Nearly all materials are transferred from one location to another by pipeline or with a front-end loader (forklift truck) and pallets.

Valley Co-op does not formulate much material in advance because it is difficult to predict what infestations will occur or when. Thus, formulating is done almost on a day-to-day basis with inventories generally varying from 2-days' to 2-weeks' supply. The practice is to formulate the items with the lowest, fastest moving inventories. In this way, they can save on warehouse space and storage and handling costs, and avoid excessive inventory carryover from one season to the next.

The association delivers most of the formulated chemicals with its own trucks to each of the member cooperatives in the Rio Grande Valley. However, outside of the valley the association delivers mainly to 4 subwarehouses owned and operated by cooperatives handling Valco chemicals. These 4 cooperatives then deliver to surrounding cooperatives and are paid a fee sufficient to cover handling costs for warehouse and delivery service.

Valley Co-op does not do any custom application of liquid pesticides, and very little is done by most of the local associations. However, local associations will arrange for custom applicators to apply the material, if requested.

Quality Control

Providing its members with quality chemicals is a primary objective of Valley Co-op. The plant has a quality-control laboratory in which each batch of material is tested to insure the exact amount of each ingredient, and to determine the product's emulsifiability in any type of water found in its trade areas. Before a batch is removed from the kettles, an emulsification test and a specific gravity test is run. These tests show almost immediately if the product mixes with water and if the ingredients are in proper proportion. These tests take 20 minutes. In addition, each batch is chemically analyzed for actual content of each ingredient, this usually requires 24 hours. To maintain the check, each batch is numbered and all drums identified with a batch number. Thus, at any future time, the tests can be verified.

Representatives of the association stated that this quality-control system is considerably more exacting than those used by most formulators. Many other formulators sample batches periodically and send them to a central laboratory for analysis. However, by the time the results are received, the material may already have been applied on the farmer's fields.

Valley Co-op's rigid quality control system has been successful in that no batch formulated has failed to meet the State's requirements. This assurance of quality has also created member confidence in the program.

The laboratory also tests the effectiveness of some chemicals on various pests; but such chemical and entomological research is limited.

Valley Co-op employs a professional chemist and maintains a modern laboratory in which all products are analyzed.

Safety

Valley Co-op is very conscious of the welfare of its employees and has incorporated many safety features and devices into its chemical blending operations. In addition, all employees are required to wear masks and protective clothing when needed. Two showers are located by the formulating area should a worker come in direct bodily contact with toxic material.

There are fire control devices in convenient places and all employees are cautioned about the hazards of handling toxic chemicals. Failure to adhere to safety regulations can result in immediate dismissal.

Employees are periodically checked for body effects of a volatile chemical (parathion) by means of a blood cholenstrase level test. A tolerable cholenstrase range is established and employees exceeding this range are not permitted to work with parathion again until the cholenstrase level returns to normal.

Farmers are also informed of the characteristics of the chemicals they are using and the precautions that should be taken to protect themselves, their crops, livestock, and the natural resources.

The association has its own quality control program, wherein all products must meet certain specifications. In addition, products formulated are registered with the U.S. Department of Agriculture, and carry labels indicating their active material content and the precautions necessary for their use.

Educational and Promotional Activities

Educational and promotional activities are conducted by the chemical division manager, fieldmen, and the local cooperatives.

The local cooperatives play a significant role in determining how much farm chemicals they distribute each year. To sell cotton chemicals, the local manager must be familiar with cotton production, pest problems, and chemical controls. Valley Co-op reported that one local manager who kept abreast of cotton infestation and control and assisted his members in pest control sold 10 times as much as another manager who had the same number of patrons but did not do this.

At the wholesale level, a farmer-education program is carried out by the manager of the chemical division. He makes periodic field checks and keeps abreast of current conditions. He conveys his reports of field conditions and recommends controls through a weekly television broadcast during the heavy infestation periods. Thus, the results of field inspection and recommended practices are available not only to Valley Co-op members, but to all farmers in the area.

In addition, during the infestation season farmers are taken on tours of fields to observe the problems and methods of detection and control. During the remainder of the year, the chemical division manager conducts a series of farmer and dealer meetings to discuss pest problems and control. Last year 35 of these meetings were held.

Summary of Benefits

In recent years some problems experienced by cooperatives in attempting an adequate farm chemical program have been: (1) Cooperatives are not basic producers of farm chemicals; (2) there is a trend toward greater use of proprietary chemicals; (3) there is a trend toward more direct distribution from the formulator to the farmer; and (4) many of the present formulation facilities are not adapted to producing products farmers request.

This study shows how 2 cooperatives have solved some of these problems and provide an outstanding liquid pesticide formulation and distribution service.

The success of both organizations is illustrated by their rapid growth. Valley Co-op Oil Mill has supplied farmers with over $3 million of pesticides in the 3 years it has been providing such a service. Its 1963 sales were double those of 1962, and 1964 volume was 35 percent over that in 1963. Valley Chemical Company has supplied its members with about $20.5 million of chemicals in its 10 years of existence. Its sales in 1963 were 30 percent over those in 1962, and volume in 1964 was about the same as in 1963.

Farmer members of these cooperatives have realized substantial benefits in obtaining pesticides with relatively small investments. The principal ways they have benefitted are as follows:

1. Farmers have achieved their primary objective--to obtain a dependable source of quality pesticides. This is assured through rigid quality control in formulating operations.

2. Farmers receive a broad and useful pest control educational service. Representatives of their cooperatives inform them of current problems and controls through meetings, tours, broadcasts, letters, and personal visits.

3. Farmers have realized substantial savings by operating their own liquid formulating facilities for 2 reasons: (a) Raw materials are purchased in large quantities to supply the pooled requirements of many farmers; and (b) manufacturing and distribution costs per unit are low because of large volumes and efficient operations. They were equal to 14 percent of the cost of sales in one association and to 8.5 percent in the other. These data, indicating the ultimate cost to farmers, more accurately indicate the benefits achieved than the average of 18-percent and 6-percent patronage refunds that were declared by the respective associations in 1963 and 1964.

Some Safety Rules for Pesticide Use

** Read the container label...follow the directions.

** Mix pesticide solutions in a well-ventilated area, preferably outside.

** Avoid inhaling pesticide sprays or dust.

** Never smoke while handling pesticides.

** When using a pesticide outdoors, apply when there is little or no wind ... to minimize drifting of the spray or dust.

** Don't use pesticides near wells, cisterns, and other water supply sources.

** Avoid chemical contamination of streams, lakes, or ponds in order to protect fish and wildlife.

** When protecting food crops against pests, observe proper times and rates of application.

** Keep weed control chemicals away from flowers, ornamental shrubs, and other valuable plants.

** Wash with soap and water and change clothing immediately if you spill a pesticide on skin or clothing.

** If a pesticide is swallowed accidentally, call a physician at once. If splashed in eyes, flush with water immediately.

** Store pesticides in closed, well-labeled containers, where children and pets cannot reach them. Do not place near food, feed, or seed.

Other FCS Publications Available

Handbook of Major Regional Cooperatives Handling Supplies, 1962 and 1963, General Report 125. J. Warren Mather.

Cooperative Bulk Fertilizer Blending in the Upper Midwest, General Report 122. Theodore R. Eichers.

Improving Management of Farmer Cooperatives, General Report 120. Milton L. Manuel.

Broiler and Turkey Feed Financing by Cooperatives, General Report 118. George C. Allen.

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Lawn and Garden Services in Eastern Farmer Co-ops, General Report 107. John M. Bailey.

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Liquid Fertilizer Distribution by Local Cooperatives in the Pacific Northwest, General Report 95. B. H. Pentecost.

Bulk Distribution of Fertilizer and Lime in the Northeast, General Report 24. Warren K. Trotter.

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